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Cortopassi et al.

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(54) **METHOD AND APPARATUS FOR USING PRESSURE INFORMATION FOR IMPROVED COMPUTER CONTROLLED HANDWRITING RECOGNITION DATA ENTRY AND USER AUTHENTICATION**

(75) Inventors: **Michael Cortopassi**, Arlington Heights, IL (US); **Edward Endejan**, Gurnee, IL (US)

(73) Assignee: **Access Co., Ltd.**, Tokyo (JP)

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G06K 9/18 (2006.01)

(52) **U.S. Cl.**
USPC **382/186**; 382/313; 345/179

(58) **Field of Classification Search**
USPC 382/119, 120, 123, 187
See application file for complete search history.

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Primary Examiner — Tom Y Lu
(74) *Attorney, Agent, or Firm* — Berry & Associates P.C.

(57) **ABSTRACT**

A method and system utilizing both (x, y) coordinate ("spatial") stroke data and associated pressure information for improved handwriting recognition. The method and system can also be applied to all types of handwriting-based data entry applications and also to user authentication. The digitizer pad used in the computer system gives both spatial information and associated pressure data when a stroke is being drawn thereon, e.g., by a stylus. Pressure information can be used to differentiate between different character sets, e.g., upper case and lower case characters for certain alphabetic characters. The spatial stroke data then identifies the particular character. The pressure information can also be used to adjust any display attribute, such as character font size, font selection, color, italic, bold, underline, shadow, language, etc. The associated pressure information can also be used for recognizing a signature. In this case, a user is allowed to sign a name on the digitizer pad. This provides non-character based user authentication that relies not only on the spatial stroke data but also on the pressure applied at different points in the signed name or image. Pressure information can also be used to provide improved handwriting-based data entry. For instance, in a drafting program, the pressure of a drawn line can be used to determine its width. Generally, pressure data can also be used to improve handwriting recognition tasks and heuristics.

3 Claims, 17 Drawing Sheets